

one insulin or insulin substitute, the culture medium being essentially free of mammalian fetal serum and in the presence of a fibroblast growth factor capable of activating a fibroblast growth factor signaling receptor, wherein the growth factor is exogenously supplied to the culture from a source other than just a fibroblast feeder layer, said culturing step includes being conducted for over one month with the embryonic stem cells proliferating in culture for over one month while maintaining the potential of the stem cells to differentiate into derivatives of endoderm, mesoderm, and ectoderm tissues, and while maintaining the karyotype of the stem cells.

14. (Currently Amended) A culture system for culturing primate embryonic stem cells in the absence of serum, comprising:

a fibroblast feeder layer;
serum replacement including albumin, vitamins, minerals, insulin, and transferrin; and
fibroblast growth factor exogenously supplied to the culture by other than just the fibroblast layer;
wherein the culture system is free of added animal serum, the serum replacement with fibroblast growth factor enabling the stem cells to proliferate in culture and remain undifferentiated in the absence of serum in the medium.

15. (Withdrawn) A cell line derived using the method of claim 1.

16. (Withdrawn) A cell line derived using the method of claim 9.

17. (Currently Amended) In a method of culturing primate embryonic stem cells without serum, the improvement comprising:

culturing the primate embryonic stem cells in a culture free of added mammalian fetal serum but including albumin, vitamins, minerals, insulin, and transferrin, and in the presence of fibroblast growth factor that is exogenously supplied to the culture from a source other than just a fibroblast feeder layer, so that the stem cells proliferate in culture and remain undifferentiated in the absence of serum in the medium.